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FARM MANAGEMENT AS INSURANCE FOR THE NORTHERN GREAT PLAINS AREA.

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The farmer has no absolute guarantee that he will be successful in his business for any particular year. There are many forces over which he has little or no control. There is no rule of thumb method by which he may cut out all losses and secure fabulous or even fair profits. But there are a number of guiding principles which will serve him if he is willing to think and manage while he works. These farm management principles or factors are quite similar for all the different regions of our country. But the order of their importance varies widely in different regions and with different types of farming. Out of the usual list of farm management factors the writer has selected for consideration and emphasis the following: land settlement and the selection of a farm; size of farm; diversity and rotation of crops; business methods; and adaptation of crops. He believes that these five factors are the most important and fundamental for the farmers of this particular region under present conditions, and that if farmers will give them proper attention they will succeed in their business in a region not well known or understood and in a region of apparent unusual risk.

I. LAND SETTLEMENT AND THE SELECTION OF A FARM.

Land settlement of some kind has been going on ever since Columbus discovered our country. But Land Settlement today has a new and different meaning. It suggests more guidance and help than ever

before. It implies also more capital or credit with which to start the settler than previously.

It does not necessarily mean the assimilation of a foreign population which has just arrived in this country. It may include some such folk. But it also includes young and middle-aged people from the corn belt and other densely settled agricultural regions who are being pushed out because of very high prices of land and rent where "the average farm is too small to permit an economic use of either capital or labor." "Many capable and intelligent young men are being lost to agriculture because they have neither the money nor the credit to enable them to acquire a farm in the old-established regions."

There is a shifting of owners as well as renters of farms continually. It has been said that all the farms in our country change ownership every thirty years. If this is approximately true, herein lies a wonderful opportunity for Land Settlement. Let the State, private parties and agricultural colleges step in and guide and help these settlers for the next thirty years. We should direct them from crowded farm regions to good farm regions where the farms are too large to be most efficient. Land Settlement may include some city people who are rural minded, but it refers especially to farm operators, farmers' sons, farm hands, renters or owners who need a change of location in order to secure farm profits.

While the influence of the farm practice used in the northern Great Plains extends out over our entire State of North Dakota, yet most of our scientific investigations—State as well as Federal—divide the State roughly in two districts; the humid lying east of the 100th meridian and semi-arid lying west of that line. It is interesting to note that records from the North Dakota demonstration farms and the opinions of some of our best farmers counteract the common idea that yields of small grains, especially wheat, are much greater in this humid eastern part than in the semi-arid western part. Failures are more common in the Plains section, but when climatic conditions are favorable a larger crop is produced. This should be especially significant to settlers who have sufficient capital and credit to tide them over an occasional year. Bad years come to all farm sections and it takes nerve to be a farmer in any part of our country. The danger from drought where farm management principles are followed should not be much greater than the danger from excessive moisture as found in several States. Diversity and rotation of crops and adaptation of crops to locality may never take the place of lack of rainfall and moisture in this dry-farming region, yet the introduction of safe

farm practices will help to tide over the bad years and some enterprise—either plant or animal—will bring in a return each season.

Not only must the location selected offer a real opportunity, but the land must fit the man and his family. The fit here is just as essential as in the case of a suit of clothes. Absolute honesty and integrity must be used throughout all these contracts and transactions. History tells us that a great improvement is possible and necessary here. These settlers must have some of the sterling characteristics of former pioneers. They must love the soil, be ambitious as tillers of it. The wife as well as the husband must be interested in this kind of work, because the house is the headquarters and office for the farm business. The two are knit together more closely than is the case in any other occupation.

Settlers need assistance against worthless lands as well as against land sharks. The land business has too often been conducted on a low ethical plane. And since the public interest is at stake to a large degree, it is only natural that a number of our States should provide for Immigration Departments with laws, regulations and officers. This does not need to interfere with private land companies, who wish to see settlers succeed, and have trained farm managers and economists to guide them in their dealings, and who have at least some degree of public interest at heart. The JOURNAL OF FARM ECONOMICS (Vol. 2, No. 3, July, 1920) contained one such general yet private plan for a land company that sells its land under what is known as a Crop Stock and Insurance Contract. An insurance feature provides that the buyer must insure his life to the company as beneficiary during the period of the contract for an amount equal to his indebtedness, which means that in the event of death the debts on the farm will be satisfied in full and the family will inherit the farm clear of all incumbrance.

Agricultural colleges furnish one of the most promising avenues in solving the Land Settlement problem. A group of agriculturists in North Dakota met recently and discussed "What to Raise" in North Dakota, and the two following plans were later published:

PLAN NO. 1—EASTERN NORTH DAKOTA.

What to raise will depend on many factors as location, size of farm, kind of soil, lay of land, amount of waste land and the experience and wisdom of the farmer. For the six Red River Valley counties a good cropping system for a 320-acre farm would be grain one half, cultivated crop one fourth and pasture and hay one fourth. The crops could be as follows:

30 acres—farmstead, roads and untillable land to be pastured.

70 acres wheat.
70 acres oats, barley and flax.
70 acres corn or potatoes.
40 acres brome grass, timothy and clover (pasture, hay or seed).
20 acres alfalfa.
20 acres sweet clover (pasture, hay or seed).

A Red River Valley farm cropped in this manner should on the average produce sufficient feed for 30 cattle, the pigs from 6 to 10 brood sows, and the 8 or 10 horses needed to run it. If a quarter-section farm is to be operated in the Red River Valley the amounts of the crops and live stock suggested for the half-section farm can be about cut in two.

Plan No. 2—Western North Dakota.

For the western half of the state a farm could well be cropped one half to grain, one fourth to cultivated crops and one fourth to hay and pasture crops. For a one half section farm with 70 acres of waste land the following is suggestive as to what the crops could be:

80 acres—farmstead, roads and untillable land to be used for permanent pasture.
60 acres wheat.
20 acres oats.
30 acres flax and barley.
60 acres corn, sunflowers and potatoes.
30 acres brome grass (pasture, hay or seed).
10 acres sweet clover (pasture, hay or seed).
30 acres alfalfa (hay or seed).

A half-section cropped in this manner should produce enough feed for 18 cows or their equivalent, for the pigs raised from 5 to 8 brood sows and for the 6 horses that will be needed for motive power. There should be at least one silo on the farm and better two, so as to have ensilage for a part of the summer as well as for the winter.

In comparing these two plans one notices an unexpected similarity. If the two plans are sound in organization and adaptation to locality, an ambitious settler should not be afraid to tackle the job of farming in western North Dakota. While these plans may not stand the scientific test of careful farm surveys, yet it is a step forward. The farm acreage is large, but not so large as the farms are today. A balance or ratio is suggested for crops and live stock. The plans are incomplete and should go on—after sufficient surveys of the State have been made—to show more emphatically the best size of farm, the proper ratio of land, buildings, equipment, supplies, labor and cash.

These surveys constitute the first step toward intelligent permanent farm settlement. Later there must be absolutely honest publicity as to existing conditions and future possibilities of this great agricultural region. The publicity should disclose the ownership of all land fit for settlement as farm land. Several authorities have suggested

some system of issuing real estate licenses under State regulations.

The settler must have land of quality, and yet cheap land, if he is going to be able to pay for it. The northern Great Plains is still able to furnish cheap land which many people believe offers the same inducements for home seekers that Iowa and Illinois held out ten or twelve years ago.

Probably no one believes in the adoption of a national policy for the opening of lands and the arbitrary increase of our farming population to an extent that would cause over-production and extremely low prices for farm products. But idle and half-idle land of quality in the northern Great Plains country could be settled as indicated above and the settlers themselves and society as a whole would profit thereby and our present unrest would be at least partially relieved.

II. Size of Farm—the Second Foundation for Insurance in Farming.

Acres alone do not measure the volume of farm business, but in the northwest grain and dry farming sections of our country it is perhaps the best single measure of the farm size for such an extensive type. There is perhaps no other section in our country where acres alone have so much influence on labor incomes. Profits per farmer are more important than profits per acre, and America has always been strong on profits per man even if she is weak on profits per acre. But if farms are exceedingly large, you get neither satisfactory profits per man nor satisfactory profits per acre. Insurance offered by farm management in this connection comes from the fact that the proper size of farm will bring both satisfactory profit per man and per acre. When one sees dandelion growing in his fields, mustard, quack grass, Canada thistle, or, worst of all, sow thistle—to such an extent that he can not control it—then it is time for him to look after this matter of size of farm. That's the very condition in which many northwest grain farmers find themselves today.

For most regions where spring wheat is the leading cash crop it hardly seems possible to secure the most economical production on a farm of less than 320 acres, and there is some reason to believe that 480 acres is better than a smaller size. Our farms now vary from a quarter section to four sections and the average in the State is from three quarters to one section in extent.

We are continually reminded that large ranches, stock-raising enterprises and grain farms tend to create unfortunate social conditions and do not contribute to a permanent agriculture. Migratory labor

and isolation of farm families do not contribute to the best interest of society or to the best labor incomes. One can hardly realize the extreme to which we have gone until he eats in one of our "chuck" wagons and works in the field with migratory laborers who sleep in barns.

III. Diversity and Rotation of Crops as Insurance.

Farming always involves risk. To minimize this risk arrange for from one to four major sources of income. Four chances are better than one. Diversity usually includes rotation of crops. Farmers in our region have not yet considered the subject of true rotation of crops seriously. It has not been necessary. Our new lands have found two types of farming profitable; a one crop grain farming type carrying little live stock other than the horses required to do the farm work and a second one crop live stock type of farming with a relatively small area in field crops where the stock is carried during the growing season on permanent (usually wild grass) pastures.

In my opinion we can look for one definite standard to be developed for our semi-arid region and another somewhat definite standard for our Red River Valley region. Rotations that are being tried out on our State Demonstration Farms vary from "a four-year rotation of corn, wheat, barley and sweet clover, to a nine-year rotation of corn, wheat, sweet clover, flax, oats, potatoes, and barley." Just as corn, cotton and hay are given the most favorable location in a rotation series for their respective agricultural provinces, so wheat must be given the favored place as the best cash crop producer in our region.

The Fallow Situation.

This district constitutes one of the few real fallow regions in the United States, and one might conclude, therefore, from a historical standpoint, that it is one of the most backward agricultural regions. This is not the case, but it is an interesting situation that deserves some study.

Fallowing of some kind is quite a common but expensive and temporary farm practice. Farmers cling to it in certain parts of North Dakota because they do not realize that something better can be substituted, because it helps them to retain a large acreage or farm, because of protection it offers against weeds, and because of protection it offers as a last resort for bad years.

IV. Business Methods, Farm and Cost Accounts as Insurance.

The shrewd business man makes as few guesses as possible. He gets together the facts regarding the conditions, and then proceeds to analyze them carefully. He draws such conclusions as may be made safely. A farmer can take advantage of this same principle by keeping farm records of various kinds. A study of these records makes farming a safer business. Mistakes can be avoided. Time can be saved. The farmer can not only help himself, but he can help others by coöperating with his State College of Agriculture in securing data for cost of production studies. From these tabulations and studies he and his neighbors can tell what to expect in the way of yield, cost and profit. These studies will aid him in planning ahead for the lean, poor and dry years. Our farmers have made more progress in this line in the last four years than in any other phase of farm management. They know that the cost of growing all crops (like wheat) is usually greater on the eastern than on the western farms, but that crop risks are greater in western than in eastern North Dakota. One bulletin indicates that the risk is 15 percent to 25 percent greater in the western than in the eastern part of the State. This risk is reflected in the value of land and is partially compensated for in low land values. Cash rent has been estimated $2.97 per acre for the eastern section and only $1.34 per acre for the western section, but share rent is the usual form of rent in this section.

Business methods include some system of credit. Farmers must have money to run their business. They are learning that they can not borrow at a high rate and accept a low rate on their own investment. They can not make profits in that way. Our North Dakota farmers have taken advantage of the Rural Farm Loan Law. E. G. Quamme, of the Federal Land Bank of St. Paul, stated on January 12, 1920: "We have issued to the farmers of North Dakota up to January 1, 1920, the sum of $17,878,900. These loans were made through the one hundred and seventy chartered farm loan associations in that State."

About 65 percent of the money borrowed has been used to refund loans and the balance for such purposes as erecting buildings, making improvements on the land, buying machinery, live stock and equipment, and for the purchase of land. In other words, about 65 percent of the money loaned in North Dakota has been used for the refunding of loans and 35 percent has been used for acquiring land and extending operations.

V. Adaptation of Crops to Locality as One of the Big Sources of Insurance.

Time was when men took out only fire insurance on buildings or stock of goods and life insurance on their lives. But now there is a gradually increasing interest in many forms of insurance which have so gained in favor that he is deemed a poor business man, indeed, if he does not take advantage of them so as to play a safe game. The banker insures his bank against burglary, the fair management and Chautauqua associations against rain, the employer against strikes and accidents to employees. Hail insurance insures our farmers against loss if their crops are destroyed by hail, and tornado insurance protects farmers from another form of Nature's wrath. High-priced blooded live stock is insured. These all convince us that the insurance field has extended over a far greater area than its earlier projectors dreamed of. And because of the interesting and successful results that our agronomic and live-stock scientists are accomplishing I like to think of adaptation of crops and animals to localities as one of the very best forms of insurance. It is cheap insurance, but farmers take to it better and more quickly than even to the rotation of crops. They see the results sooner and more vividly.

Things have to be done properly and early in North Dakota. The north is the region for quick step and action. The short season demands it, although little time is lost because of unfavorable weather during that short season. This is one reason why many like to call our State the Sunshine State. Something like 144 days are available for field work. Our farmers have learned to risk spring frost rather than fall frost.

The Plains country has high fluctuations in yield, due to variations in rainfall, and while some old and also recent authorities claim that these can not be sufficiently overcome by scientific and cultural methods to change the situation materially, I know the temper of our agronomic and live-stock scientists too well to despair of their discovering something that has not been known before. Many good results are already apparent. Hailstorms scared away some of our early settlers, but now we have private or State protection from them if we want to invest in it. We have always had prairie grass, flax and wheat, but only recently we found the use and adaptation of not only crops, but of *varieties* of a crop to a locality. These legumes and cultivated crops look like high-class insurance because they bring crops or partial crops under adverse conditions much more than in the case of grain crops. Corn will produce a fair yield of stover

even in dry years. It will produce winter feed for live stock in dry-farming regions when there is so little summer rainfall that prairie grass is withered with heat and when opportunities for cutting hay are very limited.

While silage is usually fed to dairy cattle, yet it can be used as feed for other live stock, and it is another possibility from corn as an insurance against dry years. It has been kept at our North Dakota College for four years and records are on file of its having been kept in good condition for fourteen years. Pit silos burrowed beneath the surface preserve and furnish summer or winter feed against the dry year and cost little but labor.

Grimm alfalfa and brome grass offer new insurance against adverse conditions in North Dakota. They may not yield as much feed per acre as corn and some other crops, but they are labor savers in that they do not have to be planted every year. One of our college students tells me that he has a field now in alfalfa for the eleventh year. This shows that it does not adapt itself to short rotation plans. Brome grass is somewhat similar in this respect. These crops should remain as hay fields as long as they produce well. Brome grass may be pastured to good advantage for several years after it becomes so sod bound that it no longer produces a profitable yield of hay. However, by proper management these crops may be made a part of either a regular short or long rotation scheme. But somewhat long rotations seem to be favored in our territory. It is interesting to note that many farmers in North Dakota are growing these crops long before they practice a regular rotation.

Alfalfa, corn, sunflower, sweet clover and potatoes are protecting and serving us again when they furnish work for June and fill up a labor gap that has been a weak part of our whole northwest farm history. Dr. Spillman told me a number of years ago that this gap might be filled up with millet and buckwheat, but we have found other crops that promise to do it even better.

SIZE OF INITIAL PAYMENT REQUIRED TO PERMIT PURCHASE OF A FARM IN A GIVEN TIME.[1]

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In a former study,[3] devoted mainly to pre-war agriculture, the author pointed out that it was extremely difficult for farms to pay for themselves in a reasonable length of time. Even if sufficient credit were available to permit the purchase of a farm without an initial payment of considerable size, in no area that had been surveyed could the farms be paid for without reducing the expenditures for family use to a penurious sum. It was further concluded "that only they who are well-fitted by training or experience, and who in addition possess somewhat more business ability than the 'average' farm operator, should expect to earn a living on the farm and at the same time save enough to buy the farm."

Inquiries from several widely scattered parts of the United States asked what part of the farm capital must be paid at the time of purchase in order to enable the operator-purchaser to amortize the farm in a reasonable length of time. Accordingly, the present study was undertaken, but only for the areas that had been included in the previous treatise, although several additional surveys have since been published.

With the prevailing land prices, about the only chance for an ordinary young man who has no capital to acquire ownership of a farm is to inherit one or to "marry" one. A long period of time is required to enable a tenant farmer to save from one third to one half the value of the farm. *It must be remembered, however, that averages may deceive. The misfits and the failures hide the successes and profits of the better adapted.* Any other industry would appear less rosy if measured in terms of the "average," where the failures as well as the successes are included, than if only the survivals are considered. In agricultural pursuits there has been a tendency for

[1] Contribution of the Department of Field Crops, Utah Experiment Station.

[2] The author is indebted to Delmar C. Tingey for the calculation involved in compiling Tables 1, 2, 3, and 4.

[3] Stewart, George, "Can Farms of the United States Pay for Themselves?" *In* JOURNAL OF FARM ECONOMICS, Vol. II, pp. 177–193.

the misfit to remain, whereas in the more strictly commercial industries they are automatically dropped by insolvency. In spite of this, no one should deceive himself that good farms are easy to obtain unless some capital is at his command.

Table I shows the average capital, the farm income, the prevailing interest rate, the size of necessary payment and the amount of money

TABLE I.—*Average capital, farm income, prevailing interest rate, annual payment necessary to amortize farm in 10, 20, or 30 years, and the money left from farm income for family use.*

Area.	Average Capital.	Farm Income.	Prevailing Interest Rate.	10 Years.		20 Years.		30 Years.	
				Necessary Payment.	Money Left.	Necessary Payment.	Money Left.	Necessary Payment.	Money Left.
North Atlantic States									
New York	$ 5,527	$ 757	5.6	$ 737	$ 20	$ 466	$ 291	$ 385	$ 372
New Jersey	19,165	1,699	5.8	2,580	− 881	1,644	55	1,363	336
Pennsylvania	10,486	1,313	5.8	1,412	− 99	900	413	746	557
North Central States									
Illinois (Kane Co.)	37,896	2,766	6.0	5,149	−2383	3,301	− 535	2,753	13
Illinois (West central)	51,091	3,176	6.0	6,941	−3765	4,454	−1278	3,711	−535
Indiana	17,535	1,187	6.2	2,428	−1241	1,555	− 368	1,302	−115
Iowa	23,193	1,450	5.9	3,136	−1686	2,006	− 556	1,667	−217
Michigan	11,756	1,068	6.6	1,652	− 584	1,077	− 9	911	157
Minnesota	14,636	1,170	6.8	2,065	− 895	1,362	− 192	1,158	12
Nebraska	26,646	1,717	7.1	3,814	−2097	2,539	− 822	2,174	−457
Ohio	5,652	443	6.1	772	− 329	497	− 54	316	27
Wisconsin	31,036	1,940	5.8	4,177	−2237	2,663	− 723	2,208	−269
South Central States									
Kentucky (Bluegrass)	37,793	2,576	7.1	5,409	−2833	3,600	−1024	3,082	−506
Kentucky (Southwest)	17,029	1,208	7.1	2,437	−1229	1,623	− 415	1,389	−181
Missouri	9,033	822	6.8	1,275	− 453	841	− 19	714	108
West Virginia	3,255	344	6.4	451	− 107	293	51	247	97
Southern States									
Georgia (Brooks Co.)	8,992	952	8.7	1,383	− 431	965	− 13	846	106
Georgia (Sumter Co.)	15,781	1,712	8.7	2,428	− 716	1,693	19	1,502	210
South Carolina	5,529	404	8.4	839	− 435	580	− 176	511	−107
Texas	16,019	1,457	9.0	2,497	−1040	1,757	− 300	1,569	−112
Western States									
Arizona	20,706	2,370	9.4	3,283	− 913	2,336	44	2,102	268
Montana	27,173	2,185	10.0	4,422	−2337	3,191	−1006	2,907	−722
Oregon	22,699	1,322	8.0	3,383	−2061	2,312	− 990	2,016	−694
Utah (Provo)	11,688	1,312	9.0	1,822	− 510	1,281	31	1,144	168
Utah (Six counties)	11,886	1,135	9.0	1,852	− 717	1,303	− 168	1,163	− 28
Utah (Salt Lake Valley)	12,296	927	9.0	1,917	− 990	1,347	− 420	1,204	−277

left from farm income if the farm were amortized in 10, 20 or 30 years at prevailing interest rates. It is shown that in no area surveyed can the farms pay for themselves in 10 years and leave a reasonable amount of money for family use, even as little as $100 a year. In fact, only one area has any left at all, and this one only $20 a year.

When the time of payment is lengthened to 20 years, one area has about $400 annually, another $300, and a third $55 above the required annual payment. All other regions still find the total farm income too small to meet the payment on the farm, several lacking in the neighborhood of $1,000 a year. If 30 years be allowed in which to pay for the farm, twelve of the twenty-six areas have money left over, but only five of them have as much as $200 a year, only one as much as $500, and none as much as $600 for family use.

Table 2 shows the size of initial payment that must be made at the time the farm is purchased when the family uses no money, $300 a year, and $600 a year, respectively, from the farm income. When the family is not allowed any expenses whatever from the farm income, only one area can pay for its farms in 10 years, seven in 20 years, and thirteen (just half of them) in 30 years. The size of payment that must be made at the time of purchase varies from nothing to $27,710 for 10 years, from nothing to $14,659 for 20 years, and from nothing to $7,813 for 30 years.

When the family uses $300 yearly from the farm income, then these figures are correspondingly increased. No area can pay in 10 years, one in 20 years, and only three in 30 years. The initial payments required vary from $2,115 to $29,918 for 10 years, from nothing to $18,000 for 20 years, and from nothing to $11,493 in 30 years. When 20 years are allowed for payment, thirteen of the twenty-six areas require initial payment in excess of $5,000 and six others between $3,000 and $5,000.

Should the family be permitted to spend as much as $600 a year from the family farm income, there is no area that can pay for its farms even in 30 years. In order to permit such lavish expenditure, in addition to 30-year mortgages being assumed, large initial payments would have to be made, varying from $3,275 for New York to $15,623 for Kane County, Illinois, and $14,567 for Oregon.

Table III shows the average percentage of the farm capital that must be advanced at the time of purchase in order to enable the operator to pay for the farm. These data really show more than do the actual amounts of money required to be paid, because they show the percentage of the farm value. With no money used for family

TABLE II.—*Size of payment that must be made at time of purchase in order to amortize farm in 10, 20, or 30 years when family uses none, $300, or $600 annually from farm income.*

Area.	10 Years.			20 Years.			30 Years.		
	None.	$300.	$600.	None.	$300.	$600.	None.	$300.	$600.
North Atlantic States									
New York	......	$ 2,115	$ 4,365	......	$ 107	$ 3,661	......	......	$ 3,275
New Jersey	$ 6,545	8,774	11,003	......	2,856	6,253	......	......	3,712
Pennsylvania	736	2,964	5,193	......	......	2,180	......	......	605
North Central States									
Illinois (Kane Co.)	17,539	19,747	21,955	$ 6,137	9,578	13,019	......	$ 3,950	8,080
Illinois (West central)	27,710	29,918	32,126	14,659	18,100	21,542	$ 7,364	11,493	15,623
Indiana	9,046	11,233	13,419	4,151	7,535	10,919	1,548	5,588	9,627
Iowa	12,468	14,686	16,904	6,428	9,897	13,366	3,018	7,192	11,364
Michigan	4,177	6,322	8,468	98	3,374	6,650	......	1,845	5,716
Minnesota	6,342	8,467	10,593	2,064	5,288	8,512	......	3,640	7,432
Nebraska	14,653	16,749	18,846	8,631	11,781	14,931	5,604	9,283	12,961
Ohio	2,410	4,607	6,804	614	4,027	7,439	......	3,716	7,800
Wisconsin	16,620	18,848	21,077	8,428	11,924	15,421	3,782	7,999	12,217
South Central States									
Kentucky (Bluegrass)	19,796	21,892	23,988	10,752	13,902	17,052	6,205	9,884	13,562
Kentucky (Southwest)	8,588	10,684	12,780	4,357	7,507	10,657	2,219	5,898	9,577
Missouri	3,210	5,335	7,461	204	3,429	6,653	......	2,427	6,218
West Virginia	773	2,939	5,105	......	2,763	6,093	......	2,675	6,628
Southern States									
Georgia (Brooks Co.)	2,802	4,752	6,703	121	2,917	5,713	......	2,038	5,190
Georgia (Sumter Co.)	4,655	6,605	8,555	......	2,619	5,415	......	946	4,097
South Carolina	2,866	4,843	6,819	1,677	4,535	7,393	1,157	4,402	7,647
Texas	6,672	8,596	10,521	2,736	5,472	8,209	1,144	4,208	7,273
Western States									
Arizona	5,756	7,647	9,539	......	2,270	4,931	......	315	3,270
Montana	14,361	16,205	18,048	8,565	11,120	13,674	6,750	9,554	12,359
Oregon	13,829	15,842	17,855	9,721	12,667	15,613	7,813	11,190	14,567
Utah (Provo)	3,272	5,196	7,121	......	2,453	5,354	......	1,348	4,413
Utah (Six counties)	4,600	6,524	8,449	1,532	4,269	7,005	286	3,350	6,415
Utah (Salt Lake Valley)	6,351	8,276	10,200	3,831	6,567	9,303	2,829	5,894	8,958

expenses, the percentages vary from 0 to 60.9 for 10 years, from 0 to 42.8 for 20 years, and from 0 to 34.4 for 30 years. When $300 is used for living, the percentages vary from 28.3 to 90.3 for 10 years, from 0 to 84.9 for 20 years, and from 0 to 82.2 for 30 years. When $600 is spent for living expenses, the percentages vary from 15.8 to 203.6 for 30-year payments, some of the farm incomes being so small as to require that in addition to paying outright for the farm a sum

TABLE III.—*Percentage of capital that must be paid at time of purchase in order to amortize farm in 10, 20, or 30 years when family uses none, \$300, or \$600 annually from farm income.*

Area.	Average Capital.	10 Years.			20 Years.			30 Years.		
		None	\$300.	\$600.	None	\$300.	\$600.	None	\$300.	\$600.
North Atlantic States										
New York	\$ 5,527	.....	38.3	79.0	.....	1.9	66.2	.....	.....	59.3
New Jersey	19,165	34.2	45.8	57.4	.....	14.9	33.1	.....	.....	19.4
Pennsylvania	10,486	7.0	28.3	49.5	.....	.....	20.8	.....	.....	5.8
North Central States										
Illinois (Kane Co.)	37,896	46.3	52.1	57.9	16.2	25.3	34.4	.....	10.4	21.3
Illinois (West central)	51,091	54.0	58.6	62.9	28.7	35.4	42.2	14.4	22.5	30.6
Indiana	17,535	51.6	64.1	76.5	23.7	43.0	62.3	8.8	31.9	54.9
Iowa	23,193	53.8	63.3	72.9	27.7	42.7	57.6	13.0	31.0	49.0
Michigan	11,756	35.5	53.8	72.0	8.3	28.7	56.6	.....	15.7	48.6
Minnesota	14,636	43.3	57.8	72.4	14.1	36.1	58.2	.....	24.9	50.6
Nebraska	26,646	55.0	62.9	70.7	32.4	44.2	56.0	21.0	34.8	48.6
Ohio	5,652	42.6	81.5	120.3	10.9	71.2	131.6	.....	65.7	138.0
Wisconsin	31,036	53.5	60.7	67.9	27.2	38.4	49.7	12.2	25.8	39.4
South Central States										
Kentucky (Bluegrass)	37,793	52.4	57.9	63.5	28.4	36.8	45.1	16.4	26.2	35.9
Kentucky (Southwest)	17,029	50.4	62.7	75.0	25.6	44.1	62.6	13.0	34.6	56.2
Missouri	9,033	35.5	59.1	82.5	2.3	38.0	73.7	.....	26.9	68.8
West Virginia	3,255	23.7	90.3	156.8	.....	84.9	187.2	.....	82.2	203.6
outhern States										
Georgia (Brooks Co.)	8,992	31.2	52.8	74.5	13.5	32.4	63.5	.....	22.7	57.7
Georgia (Sumter Co.)	15,781	29.5	41.9	54.2	.....	16.6	34.3	.....	6.0	26.0
South Carolina	5,529	51.8	87.6	123.3	30.0	82.0	133.7	20.9	79.6	138.3
Texas	16,019	41.6	53.7	65.7	17.1	34.1	51.2	7.1	26.3	45.4
Western States										
Arizona	20,706	27.8	36.9	46.1	.....	11.0	23.8	.....	1.5	15.8
Montana	27,173	52.8	59.6	66.4	31.5	40.9	50.3	24.8	35.2	45.5
Oregon	22,699	60.9	69.8	78.7	42.8	55.8	68.8	34.4	49.3	64.2
Utah (Provo)	11,688	28.0	44.5	60.9	.....	21.0	45.8	.....	11.5	37.8
Utah (Six counties)	11,886	38.7	54.9	71.1	12.9	35.9	58.9	2.4	28.2	54.0
Utah (Salt Lake Valley)	12,296	51.6	67.3	83.0	31.2	53.4	75.7	23.0	47.9	72.9
Average	18,250	42.1	57.9	75.4	16.3	37.3	63.2	8.1	28.5	57.2

equal to the farm capital be put at interest and this interest added to the total farm income.

If these figures of the twenty-six areas be averaged without taking into account the number of farms in each area, the results are shown in Table IV.

From the above figures it is apparent that men with no capital will find it difficult to purchase farms, even could they secure all the credit

TABLE IV.—*The average percentage of farm capital that must be paid at time of purchase to amortize farm in 10, 20, or 30 years when no money, $300, or $600 is used annually for family expenses.*

Time to Amortize Farm.	Amount Used Annually for Family Expenses.		
	None.	$300.	$600.
10 years	42.1	57.9	75.4
20 years	16.3	37.3	63.2
30 years	8.1	28.5	57.2

needed. Twenty years represents the best part of a man's lifetime, and $300 is little enough money to provide a family with clothing, amusement and food that must be purchased, to say nothing of educational, religious or community advantages recognized to be essential to good citizenship and to a reasonable standard of living.

If a family be of any size, and if it take part in social and educational life of the community, $600 a year will not be a lavish sum of money with which to defray cash expenses. If this amount be used, then 59 per cent of the farm price must be paid at the time of purchase in order to permit its being amortized in 30 years from the farm income. The corresponding figures for 20 and 10 years are 63 and 75 per cent, respectively.

LABOR AND MATERIAL REQUIREMENTS IN THE PRODUCTION OF COMMERCIAL FIELD BEANS.

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The late war, with acompanying high prices for farm products, caused a large increase in the acreage of field beans in the United States resulting in competition between this crop and other cash crops grown in commercial bean regions. Because of the increasing economic importance of field beans and the demand for cost of production data, the Office of Farm Management and Farm Economics, United States Department of Agriculture, made a study of the labor. material and other requirements entering into the cost of production of this crop. Data were obtained in the spring of 1918, representing the experience of the men interviewed under conditions as they existed during the crop year 1917. One hundred sixty-six estimates were secured in seven of the leading bean producing States in areas which afforded typical conditions for the State or regions as a whole.

The regions chosen as representative were, for the humid area, Genesee County in New York, Tuscola County in Michigan and Columbia County, Wisconsin; for the Pacific Northwest, Latah County in Idaho; in the intermountain region for both dry and irrigated conditions, Weld County, Colorado; for dry land conditions, Mora County in Northeastern New Mexico and Torrance County in Central New Mexico; for Southern California, Ventura County; for the great interior valleys of California, Stanislaus County. In each of these counties field beans have for many years been one of the important crops and the farm practice is well established.

The discussion which follows is based on data obtained in these regions and is limited to the labor and material requirements in the production of this crop. These factors are of recognized value in making farm organization adjustments where the type of farming has remained fairly constant and in approximating costs for any given year, providing the farm practices in crop production have not changed materially.

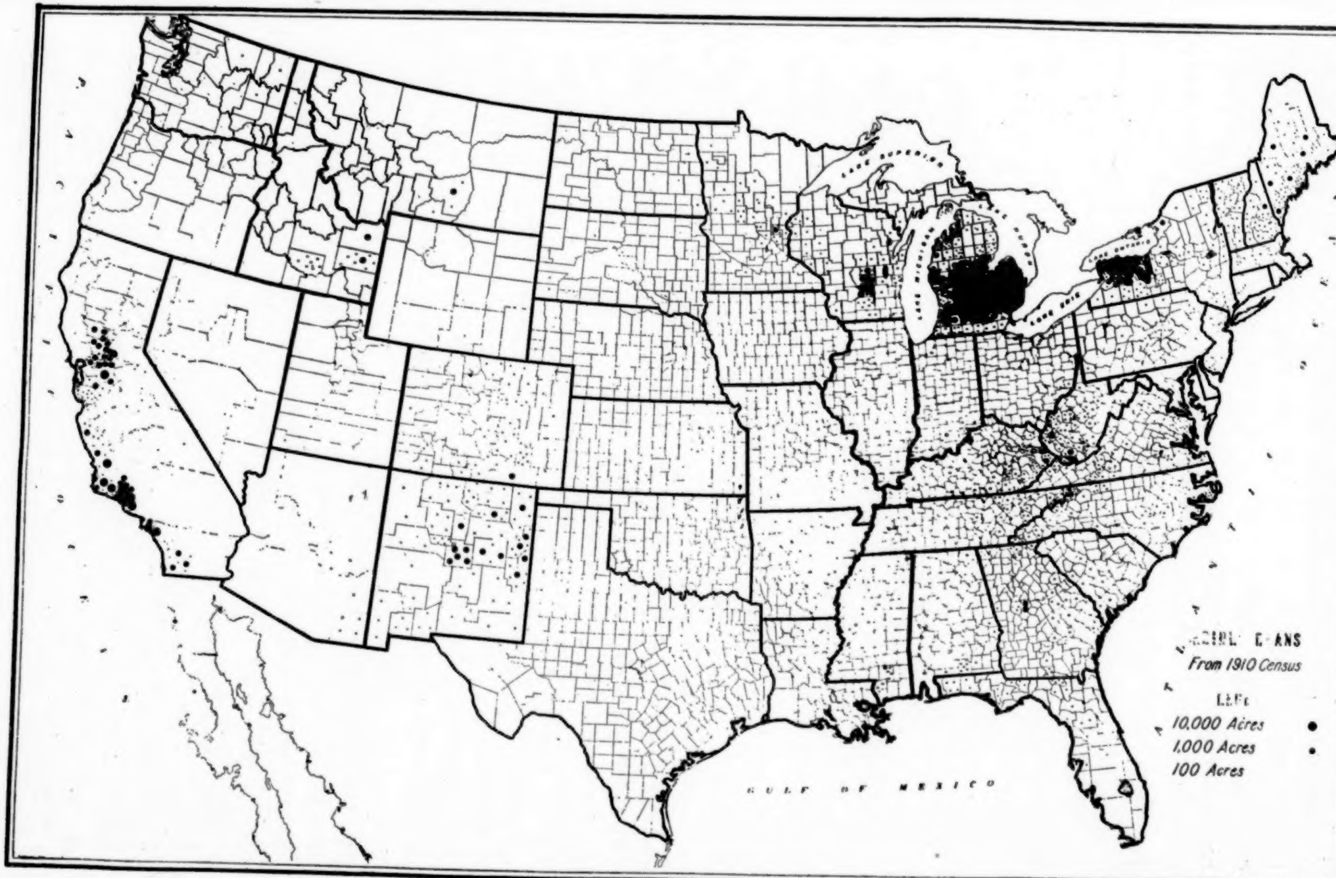

FIG. 1. Map of the United States showing areas where dry edible beans are grown commercially.

Geography of Production.—The geographic distribution of the bean acreage, as reported by the 13th Census is shown by the accompanying map, Fig. 1. Reference to this map shows that the principal regions where beans are grown commercially are Western New York and Central Michigan, the high altitudes of Colorado, Idaho and New Mexico and certain sections of California.

The bean plant grows well in most sections of the United States where there is a sufficiently long growing period free from frost to which it is very susceptible. The length of growing season required to mature a crop of field beans depends upon the variety and varies from 90 to 130 days.

Of all varieties the lima bean is the most sensitive to cold. It is not grown extensively as a field crop in any region of the United States except a narrow strip along the Pacific Coast in Southern California, of which Ventura County is the center of production. The almost constant high humidity caused by the heavy sea fogs which prevail here, makes this region especially well adapted to the production of lima beans.

While commercial beans are grown largely in the Northern States, it is probable that they could be grown successfully as a field crop in the Southern States. The main factors limiting bean acreage in the South seem to be the prevalence of fungus and insect enemies of this crop in the more southern localities.

Soils.—Field beans can be grown on a wide diversity of soil types, but thrive best on a warm, medium loam. Like other legumes they are partial to a limestone soil. Under humid conditions the land should be well drained, since water coming in contact with the bean for any length of time, especially in hot weather, is very injurious to the plant. Again, in the irrigated areas the bean plant is very sensitive to an alkali condition of the soil and does not thrive on alkali land where grain or sugar beets have failed. In all areas visited the field bean is produced mainly on the lighter soil types.

Bean Varieties and the Place Occupied by Beans in the Crop Rotation.—The leading commercial varieties in New York, Michigan and Wisconsin are the pea or navy type and the medium white. Of other varieties the red kidney is probably the most extensively grown. In each of the above mentioned States the bean occupies a place in the regular rotation of the farm crops. In New York they are commonly grown in a three year rotation of (1) clover, (2) beans

and (3) wheat. Where corn and potatoes enter into the rotation, these crops occupy a portion of the sod land and are usually followed by beans.

In Tuscola County, Michigan, sugar beets and field beans are important competing cash crops. It is a common practice to plant beans on sod land and follow with sugar beets. Where corn is grown, it is usually planted on sod land and sometimes followed by beans.

In Columbia County, Wisconsin, corn, which comes in direct competition with beans, is usually planted on sod land. Sometimes beans are grown on a portion of the sod land, but more often they follow corn in the rotation.

On irrigated land in Colorado, beans are usually grown in a rotation of (1) alfalfa 3 to 4 years, (2) potatoes one year, (3) beans one year, or sugar beets one year, followed by (4) small grain. Under Colorado and New Mexico dry land conditions there is no regular order of rotation of crops. The principal crops grown are beans, corn, cane and, to a lesser extent, oats, wheat and millet hay.

In Ventura County, California, up to the present time, there has been little rotation practiced on lima bean land. It is not uncommon for a grower to produce lima beans for from 4 to 10 years, on the same land. Sugar beets and barley, either for grain or hay, are the other crops grown in this region. In the upper San Joaquin Valley in Stanislaus County, California, it is a common practice to grow beans for 2 or 3 years on ground that has been in alfalfa 4 or 5 years, following with barley hay or grain and reseeding to alfalfa.

In Latah County, Idaho, winter wheat and beans are the main cash crops. Sufficient hay and other grains are grown to maintain the livestock kept on the farm. With few exceptions beans are followed by wheat in the crop rotation.

Marketing.—Beans direct from the thresher contain more or less dirt, discolored beans and other foreign matter. These beans are delivered to the local bean elevator or warehouse where they are run over a series of cleaning machines which remove much of the foreign matter. A sample is then taken and the tare or shrinkage determined. The clean marketable product remaining is usually sold to local bean dealers. Occasionally, however, the crop is handled through farmers' organizations, such as the California Bean Growers' Association and the Michigan Bean Growers' Association.

The California lima bean is a staple on the markets in all parts of the United States. The California pink, black-eye and other colored varieties are marketed principally in the southwest and southern

markets. The one exception to this rule is the red kidney, which is also grown extensively in eastern bean districts and finds a ready market in the east, especially in the New England States. The California small white, synonymous with the pea or navy variety grown in Michigan and New York, finds a ready outlet on all eastern markets.

The Colorado and New Mexico pinto bean has a standard market in the south and southwest.

New York, Michigan and Wisconsin navy and medium white beans are found on all eastern markets.

Bean Yields.—Since the yield per acre has such a decided influence on the cost per bushel or per hundredweight an attempt has been made to arrive at a fair yield to be expected in each of the States visited. In Table I the average yields for the State and farms visited in 1917 are recorded.

TABLE I.—*Annual yields.*

State and County.	Average for Farms Visited in 1917.	State Average.	1920 State Average.
N. Y.—Genesee county	10.9	9.3[1]	14
Mich.—Tuscola county	10.5	8.6[1]	13
Wis.—Columbia county	7.3	10.7[2]	10.6
Colo.—Weld county—non-irrigated	6.8		
Colo.—Weld county—irrigated	25	7.6[1]	8
N. Mex.—Mora & Torrance county	4.1	5.7[1]	6.7
Calif.—Ventura county—non-irrigated	26.5	10[1]	14.1
Calif.—Stanislaus county—irrigated	20.7		
Idaho—Latah county—non-irrigated	9.1	12[1]	10.2

For the past few seasons adverse weather conditions in New York, Michigan and Wisconsin have reduced bean yields. The spring of 1917 was especially cold and wet which delayed planting at the usual time, and was followed in the fall by an early frost which injured the crop. In addition to unseasonable weather conditions, fungus and insect enemies have been an important factor in reducing bean yields in these States.

On Colorado dry land the weather conditions in 1917 were not favorable to bean production. The late, cold spring, which delayed

[1] Monthly crop reporter, U. S. Department of Agriculture—6 year average.
[2] Wisconsin State Department of Agriculture Bulletin No. 28—5 year average.

planting, followed by a long dry period, reduced the yield to an average of about 200 lbs. per acre. An average yield for the dry land areas of Weld county is probably about 6 bushels per acre.

Dry years do not affect to so great an extent the yield of beans under irrigation. On Colorado irrigated land growers may expect yields of from 20 to 25 bushels per acre. The State average does not show the yield for dry and irrigated land separately. Since only about 20 percent of the Colorado beans are grown under irrigated conditions, the six year State average of 7.6 bushels reflects the yield on dry land rather than on irrigated land.

New Mexico beans are grown principally under dry land conditions and with a very limited rainfall. However, both in New Mexico and Colorado this rainfall occurs mainly during June, July and August after the crop has been planted. In New Mexico it is possible to mature a crop averaging about six bushels per acre. In 1917, which was an exceedingly dry year, it will be noted that the average yield was only 4 bushels per acre.

In the lima bean areas of Ventura County, California, slightly different conditions exist; the average rainfall, which amounts to only about 15 inches, occurs mainly during the months of December, January, February and March before the crop is planted. The relatively high humidity and cool temperature make it possible to produce from 18 to 25 bushels per acre without irrigation.

Atmospheric conditions of the San Joaquin Valley, of which Stanislaus County is fairly representative, are exactly opposite. Here the relative humidity is low and the temperature high, making irrigation necessary. An average yield of 20 bushels may be expected here on land that is single cropped, while on double cropped land, that is, where two crops are grown on the same land within the year, an average yield of 10 bushels per acre may be expected. The State average of 14.1 bushels includes both irrigated and dry land beans, and therefore is not representative for any given condition.

The upland bean regions of northern Idaho where the temperature is moderate have sufficient rainfall to mature field crops without irrigation. The rainfall in 1917 was considerably below normal, which reduced the average yield for that year. Like California, the State average yield includes beans grown with and without irrigation.

Requirements of Production.—The quantitative acre requirements of field bean production are discussed under the following headings:

(*a*) Man and horse labor.
(*b*) Manure.
(*c*) Fertilizer.
(*d*) Seed.
(*e*) Threshing fuel.

Man and Horse Labor.—The requirements as shown in Table II consist of all the man and horse labor expended by the farmer in the production of this particular crop.

TABLE II.—*Labor requirements.*

State and County.	Hours of Labor Per Acre.									
	Preparing Seed Bed.		Cleaning Seed and Planting.		Cultivating and Irrigating.		Harvesting and Marketing.		Total.	
	Man.	Horse	Man.	Horse	Man.	Horse	Man.	Horse	Man.	Horse
Humid areas:										
N. Y.—Genesee Co...	13.1	36.2	1.1	1.9	13.4	15.2	14.3	8.2	41.9	61.5
Mich.—Tuscola Co...	12.7	31.3	1.3	2.6	13.0	9.0	12.4	7.1	39.4	50.0
Wisc.—Columbia Co..	8.4	24.7	.9	1.7	10.9	9.8	12.1	8.7	32.8	44.9
Average..........	11.8	31.7	1.1	2.1	12.7	11.7	13.1	7.9	38.7	53.4
Semi arid areas:										
Calif.—Stanislaus Co. irrigated..........	9.8	31.7	1.3	2.3	8.9	3.9	17.5	11.3	37.5	49.2
Colo.—Weld Co., irrigated........	11.2	35.6	1.1	2.2	15.6	17.7	18.4	12.0	46.3	67.5
Average..........	10.5	33.7	1.2	2.2	12.4	11.0	17.9	11.7	42.0	58.6
Colo.—Weld Co., non-irrigated........	4.9	16.6	1.6	3.2	8.8	11.6	10.5	9.1	25.8	39.5
N. Mex.—Mora and Torrance Cos., non-irrigated....	4.5	18.5	1.3	3.4	11.5	11.7	10.8	6.3	28.1	39.9
Average..........	4.7	17.7	1.4	3.3	10.3	11.6	10.7	7.1	27.1	39.7
Calif.—Ventura Co., non-irrigated....	9.0	62.8	1.1	1.7	14.9	6.8	9.0	6.7	34.0	78.0
Idaho—Latah Co., non-irrigated....	6.2	30.2	1.2	1.8	13.9	10.0	8.9	7.0	30.2	49.0
Average..........	7.6	46.5	1.2	1.8	14.4	8.4	9.0	6.8	32.3	63.5

In all sections, except Ventura County, California, the farmer with the assistance of his hired help performed all the labor involved. In this county, however, threshing was done at a contract rate per

hundredweight, and it was therefore impossible to report the hours of labor required for this work.

In the humid bean areas of New York, Michigan and Wisconsin, the operations entering into the production of this crop are very similar. The one great difference is in the method of harvesting. In Wisconsin the threshing is from the stack in the field, while in New York and Michigan it is done from the barn. Of these three States the labor required for seed bed preparation was lowest in Wisconsin. In the latter State the light soil type was the main factor influencing the labor required. In New York and Michigan the land was covered an average of 3.7 times and 2.9 times respectively with the spring-tooth harrow which was the chief implement used. In Wisconsin the lighter spike-tooth harrow was used almost exclusively. An average day's work with the spring-tooth harrow was about 10 acres, with the spike-tooth 22 acres. Again in Michigan the land was rolled an average of 1.6 times and in New York 2.1 times, while in Wisconsin no rolling was necessary. In all three of the above States beans were planted with an ordinary grain drill at the rate of about 11 acres per day.

Labor requirements in irrigated areas of Stanislaus county, California, were considerably less than in Weld county, Colorado. It will be seen from Table II that more time was expended in cultivating and irrigating in Weld county than in Stanislaus county. In the former area the crop was cultivated an average of 2.7 times and irrigated approximately 3 times. In the latter area it was cultivated an average of 1.6 times and irrigated once. In both areas spring- and spike-tooth harrows were the principal tools used in preparing the seed bed. Planting was done at the rate of about 10 acres per day with the two-row planter.

In the non-irrigated areas of Colorado and New Mexico the labor required in producing field beans showed little variation, which is to be expected, since the factors influencing the labor requirements are very similar. The disk and spike-tooth harrow were the implements chiefly used in preparing the seed bed. Disking was done at the rate of about 10 acres per day and harrowing with the spike-tooth harrow at the rate of about 15 acres per day. Planting was done either with the two-row bean planter or one-row lister. The threshing was all done from stacks in the field. The labor required for harvesting and marketing constituted about 39 percent of the man labor and 18 percent of the horse labor required in producing the crop.

Considering all the regions visited, labor requirements were highest in the lima bean areas of Ventura County, California. The majority of this labor was expended in the preparation of a suitable seed bed. Harrowing with the spike-tooth and spring-tooth harrow and chiseling and disking are labor operations common to this area. Much of this work is expended in an attempt to eradicate the morning glory, a serious weed pest in this region. An average day's work with the disk is 12 acres, with the chisel 10 acres, with the spike-tooth 24 acres and with the spring-tooth 13 acres.

In northern Idaho the implement most commonly used in preparing the seed bed were the spike- and spring-tooth harrows. The crop was cultivated an average of 3.3 times in Ventura and 2.6 times in northern Idaho. It was hoed 2.6 times in Ventura and 1.5 times in northern Idaho.

Manure.—No manure was applied to the bean crop in the dry-land areas of New Mexico, Colorado, California or Idaho. In these areas the supply of manure is not large. In addition the rainfall is limited and manures do not decompose and become available as plant food so rapidly as in the more humid areas. Twenty-six percent of the total bean land represented in New York, 22 percent in Wisconsin, 12 percent and 4 percent respectively in the irrigated areas of Colorado and California received benefit from an application of manure. In estimating the benefit of the manure to the bean crop it is assumed that during the first year 50 percent is consumed and 30 and 20 percent respectively during the next two years.

TABLE III.—*Manure requirements.*

State and County.	Percent of Farmers Applying Manure.	Average Amount Applied, Tons.	Average Amount Chargeable to Beans, Tons.[3]
N. Y.—Genesee Co.	93	12.51	3.57
Mich.—Tuscola Co.	43	13.55	1.33
Wisc.—Columbia Co.	81	16.46	3.42
Colo.—Weld Co., irrigated	56	21.77	2.96
Calif.—Stanislaus Co., irrigated	27	8.9	.42

The average amount of manure applied represents the quantity used on the acreage actually manured. To determine the average amount chargeable to the entire bean acreage the total application was prorated over the entire acreage as shown in column 3 of this table.

[3] Prorated over entire bean acreage.

Commercial Fertilizer.—New York, Michigan and Wisconsin were the only regions visited where commercial fertilizer was applied to bean land. Farmers in the more western bean areas where the soils are relatively high in mineral nutrients but rather low in humus content, have not found it necessary to apply commercial fertilizer in order to maintain their crop yields. Forty-eight percent of the total bean acreage of New York, 13 percent in Michigan and only 4 percent in Wisconsin received an application of commercial fertilizer.

TABLE IV.—*Commercial fertilizer requirements.*

State and County.	Percent of Farmers Applying Fertilizer.	Average Amount Applied, Pounds.	Average Amount Chargeable to Beans, Pounds.[4]
New York—Genesee Co.	57	181	95
Michigan—Tuscola Co.	18	117	30
Wisconsin—Columbia Co.	12	275	7

The average application of fertilizer represents the amount used on the acreage fertilized. The amount chargeable to the entire bean acreage was determined in the same way as has been explained for manure.

Seed.—Table V shows, for each of the regions visited, the varieties grown and the average amount of seed, in pounds, applied per acre. The principal factors regulating the seed requirements are the number of seeds in a pound, the width of row and the amount of moisture available.

Under eastern conditions, with 28 inch rows, the amount per acre for the small navy is about 45 pounds, for the medium white variety 60 pounds. In the dry land pinto bean sections of New Mexico and Colorado, where the moisture is limited, the amount is about 15 pounds. However, in the irrigated pinto bean sections of Colorado, where more moisture is available, about 30 pounds per acre are used. In the lima bean areas of California more seed is planted than was formerly necessary, because of the ravages of the bean wire worm at planting time. In Idaho, where the width of row ranges from 36 to 40 inches, the amount of seed recommended for the small navy variety is about 25 pounds, for the large navy about 30 pounds per acre.

[4] Prorated over entire bean acreage.

TABLE V.—*Seed requirements.*

State and County.	Variety.	Percent of Farmers Growing This Variety.	Pounds Per Acre.
N. Y.—Genesee Co.	Navy	64	50
	Medium White	36	61
	Red Kidney	7	82
Mich.—Tuscola Co.	Navy	100	46
Wis.—Columbia Co.	Navy	100	66
	Black Valentine	19	80
Colo.—Weld Co., irrigated	Pinto	100	30
Colo.—Weld Co., non-irrigated	Pinto	100	15
N. Mex.—Mora & Torrance Co., non-irrigated	Pinto	100	17
Calif.—Ventura Co., non-irrigated	Lima	100	81
Calif.—Stanislaus Co., irrigated	Lady Washington	13	15
	Red Kidney	20	26
	Red Mexican	27	18
	Pinks	27	18
	Black Eye	73	17
	Tepary	20	12
	Blue Pods	7	9
Idaho—Latah Co., non-irrigated	Small Navy	73	23
	Large Navy	13	27
	Lady Washington	27	26
	Pinks	7	20

Threshing Fuel.—In the bean-growing regions of Mora and Torrence Counties, New Mexico and in the irrigated sections of Stanislaus County, California, no threshing fuel was furnished by the farmer. Gasoline tractors usually furnish the power to run the bean separator. The gasoline is furnished with the thresher, so that the threshing rate in these regions includes the fuel. In the lima bean section of Ventura County, California, the bean straw is used for threshing fuel. Because of the small quantity required, no attempt was made to estimate the value of the straw consumed. Cord wood, the chief threshing fuel in Latah County, Idaho, was used at the rate of .027 cord per acre. The threshing coal requirements per acre for New York, Michigan, and Wisconsin were respectively 62, 86 and 64 pounds; for Colorado irrigated 124 pounds, and for Colorado non-irrigated land 56 pounds per acre.

Bean Sacks.—Expense to the farmer for sacks furnished in marketing the crop showed considerable variation for the several areas visited. In New York, Michigan, and Wisconsin, the crop is hauled to the local warehouse or elevator in ordinary grain sacks, which are emptied and returned to the farm.

In Colorado and New Mexico, pinto beans are bagged in uniform 100 pound sacks. However, in Colorado the farmer does not furnish the sack.

In California, beans are shipped in standard 100-pound sacks with the exception of the black-eye variety, which is marketed in 90-pound sacks. Since the requirements of production in Stanislaus County are based on the yield of black-eye beans, the sack requirements for this variety are shown in the table. In Idaho the crop is hauled to the local warehouse in grain sacks of from 135 to 150 pounds, capacity, which are not returned to the farmer.

TABLE VI.—*Bean sack requirements.*

State and County.	Yield per Acre, Pounds.	Size of Sacks, Pounds.	Sacks per Acre.
N. Mex.—Mora and Torrance Co., non-irrigated	246	100	2.5
Calif.—Ventura Co., non-irrigated	1590	100	13.9
Calif.—Stanislaus Co., irrigated	1243	90	13.8
Idaho—Latah Co., non-irrigated	548	148	3.7

LABOR AND MATERIAL SUMMARY.

In Table VII are summarized the labor and material requirements of bean production which have been discussed in the preceding pages of this article. As has been stated, the methods of handling the bean crop show some variation even within the same region. Throughout this article the requirements represent the prevailing methods in each region visited. For instance, the amount of seed used per acre in New York, Michigan, and Wisconsin represents the amount recommended for the small navy variety; in Colorado and New Mexico the pinto bean; in California, irrigated, the black eye; in California, non-irrigated, the lima; and in Idaho, the small navy.

Again in New York and Michigan, the harvest labor represents the amount required when the crop was threshed from the barn; in Colorado, Wisconsin and Idaho from the stack; in the irrigated portions of California from the field; and in the non-irrigated lima bean sections of California by outside contract labor.

The value of these requirements, which may be expressed in quantities, constitute about 75 percent of the total operating expense, *i.e.*, the total cost less land rent.

TABLE VII.—*Summary of average labor and material requirements per acre.*

Items.	New York, Genesee Co.	Michigan, Tuscola Co.	Wisconsin, Columbia Co.	California (Irrigated), Stanislaus Co.	Colorado (Irrigated), Weld Co.	Colorado (Non-irrigated), Weld Co.	New Mexico (Non-irrigated), Mora and Torrence Cos.	California (Non-irrigated), Ventura Co.	Idaho (Non-irrigated), Latah Co.
Yield	10.9	5	7.3	20.7	25	6.8	4.1	26.5	9.1
Man hours	41.9	39.4	32.3	37.5	46.3	25.8	28.1	34.0	30.2
Horse hours	61.5	50.0	44.9	49.2	67.5	39.5	39.9	78.0	49.0
Manure—Tons	3.57	1.33	3.42	.42	2.96	......	......	......	......
Fertilizer—Pounds	95	30	7	......	......	......	......	......	......
Seed—Pounds	50	46	66	17	30	15	17	81	23
Threshing fuel	62[5]	86[5]	64[5]	......	124[5]	56[5]	......	......	.027[6]
Sacks—Number	......	......	......	13.8	......	......	2.5	15.9	3.7
Percent of operating expense	77	73	74	62	68	72	82	60	79

Table VIII shows how prices and yields may be applied to requirements of labor and materials in estimating the cost of bean production. Genesee County, New York, has been taken as an example.

Twenty-six percent of the entire bean acreage was manured and forty-five percent received an application of commercial fertilizer. Therefore to determine the average amount chargeable per acre the total application was distributed over the entire bean acreage. (See Tables III and IV.) Labor and materials constitute seventy-seven percent, and other costs, which include threshing, use of machinery, taxes and insurance, overhead and handling charges make up the other twenty-three percent of the operating expense.

As long as the ratio of the total cost of these quantitative requirements to the total operating expense remains fairly constant and constitutes so large a percent of the total operating expense they serve as valuable basic data for approximating costs.

[5] Pounds of coal.

[6] Cords of wood.

TABLE VIII.—*Estimated cost of producing field beans, Genesee Co., N. Y. —1920.*

Items.	Percent of 1917 Operating Expense.	Amount.	Estimated Rate.	Cost per Acre.
Man hours	26	41.9	$ .35	$14.66
Horse hours	27	61.5	.24	14.76
Manure—tons	13	3.57	2.00	7.14
Fertilizer—pounds	2	95	30	1.42
Seed—pounds	8	50	.085	4.25
Threshing fuel—pounds	1	62	12.00	.37
Total labor and material expense	77			$42.60
Total operating expense	100[7]			55.32
Use of land		$110	6%	6.60
Total cost				$61.92
Credit bean straw		.42 T	$10	4.20
Total net cost per acre				$57.72
Total net cost per bushel, 16.5 bus. yield				$ 3.50

[7] $42.60 ÷ 77 × 100 = $55.32 or total operating expense.

REVIEW OF FARMERS' BULLETIN NO. 1093 "INFLUENCE OF THE TRACTOR ON USE OF HORSES."

Farmers' Bulletin 1093 by L. A. Reynoldson, is a study of the influence of the tractor on the use of horses on 191 Corn Belt farms. The results of the study show that the tractors displaced an average of 2½ horses per farm and increased the number of crop acres per per horse from 26½ to 38½. The tractor accomplished approximately 25 percent of the tractive work. But 16 operators of the 191 allowed the horses to stand idle when the tractor was in use. The minimum number of horses necessary was governed by the cultivations of the corn crop. The average number of days the tractor was used was 29 ten-hour days. The purchase of the tractor also had a slight effect on the size of the farm which was increased by 22 acres. The main advantage of the tractors is their ability to do heavy work in a shorter time than is possible with horses.

The publication does not include the effect of the tractor on the horses themselves, whether the quality was lowered, or whether it cost as much to keep horses when a tractor was maintained for the heavier labor. The study was well presented.

FRANK APP.

STATUS OF COÖPERATIVE LIVE STOCK MARKETING IN MISSOURI.

Ralph Loomis,

College of Agriculture, Columbia, Mo.

It is interesting to note that the first instance of organized coöperative live stock marketing in Missouri of which there is record was due to the efforts of the Missouri Farm Management Association. In 1911, officers of the Association assisted in organizing a lamb shipping club in Boone County, a central Missouri county. This organization, which was short lived, made a direct saving of eighty-four dollars to members on the first carload of lambs shipped. The indirect saving effected in this instance by obliging stock dealers to operate on a narrower margin, was very considerably greater.

This lamb shipping club was modeled after the lamb shipping clubs of Tennessee, which are reported to have been in operation for more than forty years. In 1915 and 1916, the first shipping associations designed to handle hogs, cattle and sheep, after the Minnesota plan, were formed in Linn County which is two counties removed from the Missouri-Iowa line. In a few months, there was a large group of associations operating successfully in Linn and adjacent counties. The organization of new associations in Missouri has proceeded rapidly since 1917. In March, 1921, there was on file in the office of the Rural Life Department, Missouri College of Agriculture, a list of 275 organizations marketing live stock coöperatively. These associations are located in 74 of the 114 Missouri counties. Practically without exception the counties having no associations are either counties within trucking distance of one of the three big river markets (St. Joseph, Kansas City and St. Louis) or counties in the Ozark district where the lack of railroad facilities and a small amount of live stock produced are limiting factors. Of the 275 associations referred to, 129 were organized under the auspices of the Missouri Farmers Association, an organization commonly known as the Farm Clubs. Approximately 100 were organized as a result of activities of county farm bureas. A comparatively small number were started under Farmers' Union and Grange auspices. A considerable number have started without assistance from any overhead farm organization.

There is no doubt but that there are over 300 shipping associations successfully operating in Missouri at the present time (June, 1921). The average membership of 56 associations reporting to the Missouri College of Agriculture this year was 140. Twenty-nine associations operating less than twelve months had an average membership of 105. Twenty-seven associations over a year old had an average membership of 177. It is a conservative statement that shipping associations are marketing the live stock from more than 50,000 Missouri farms.

Most of the live stock shipping associations operating in Missouri are organized as local associations to handle live stock only. Of 125 typical organizations reporting, only 6 may be properly called county associations. Two of the county associations made use of four railroad shipping points, two shipped from three points, one association shipped from two points, and one county association used only one loading point. The average number of shipping points per county association was 2.83. The 119 associations, not county wide, reported as follows: Using only one railroad shipping point, 87; using two shipping points, 26; using three or more points, 6; average for 119 associations, 1.35 shipping points. Seventy-two associations handled live stock only. Twenty-five associations bought supplies for members, such as feed and fertilizer, besides marketing live stock. The balance of the associations, 28 in number, were operated in connection with coöperative elevators, warehouses, or produce exchanges.

Replies were received from 120 Missouri associations to the question: "Does your commission firm pro-rate the expense, furnishing each shipper an individual statement?" Eighty associations replied in the affirmative, 36 in the negative and 4 stated that both systems were followed. It is apparent that approximately one shipping association manager out of three is doing his own bookkeeping, while two out of three are leaving most of this work to their respective commission firms. In selling and weighing stock on the terminal markets, approximately one half the managers reporting have the hogs in their respective shipments sold and weighed by grade and without regard to ownership. Similarly, 40 percent of managers sell sheep and veal calves by grade. Less than 15 percent of managers sell any cattle by grade rather than by ownership.

Two of the most important problems of the local shipping association are grading of live stock and bookkeeping. The period of propaganda for the organization of more live stock shipping associations is rapidly passing. The organization of coöperative selling agencies on terminal markets is at present a problem of no greater impor-

Estimated Saving of 56 Missouri Coöperative Live Stock Shipping Associations—Fiscal Year, 1920.

No. Cars.	Value.	Saving per Car.	Saving per Association.
25	$ 41,597.18	$291.18(17½%)	$ 7,279.51
10	5,276.00	200.00	2,000.00
370	696,657.85	188.29(10%)	69,665.79
30	49,180.00	163.93(10%)	4,918.00
100	217,227.00	150.00	15,000.00
1	1,736.00	125.00	125.00
10	16,187.11	102.50	1,025.00
82	140,000.00	100.00	8,200.00
10	18,000.00	100.00	1,000.00
22	36,130.00	100.00	2,200.00
55	102,129.73	100.00	5,500.00
28	34,585.92	100.00	2,800.00
20	34,528.23	90.00	1,800.00
25	31,820.00	80.00	2,000.00
49	69,800.00	80.00	3,920.00
7	10,121.00	75.00	525.00
6	9,000.00	75.00	450.00
72	125,492.05	75.00	5,400.00
45	67,500.00	75.00	3,375.00
34	76,855.00	75.00	2,550.00
81	150,272.53	75.00	6,075.00
222	378,587.89	75.00	16,650.00
12	11,452.64	75.00	900.00
20	31,000.00	70.00	1,400.00
3	5,000.00	70.00	210.00
2	2,245.00	65.00	130.00
20	25,000.00	62.50	1,250.00
75	75,000.00	62.50	4,687.50
34	63,693.22	62.50	2,125.00
30	48,000.00	61.30	1,839.00
34	51,864.31	60.00	2,040.00
55	110,000.00	60.00	3,300.00
28	52,723.78	50.00	1,400.00
105	155,000.00	50.00	5,250.00
44	89,558.67	50.00	2,200.00
51	100,000.00	50.00	2,550.00
3	4,684.03	50.00	150.00
56	95,717.42	50.00	2,800.00
35	50,500.00	50.00	1,750.00
11	18,894.34	45.00	495.00
50	90,000.00	45.00	2,250.00
180	270,000.00	45.00	8,100.00
13	40,000.00	42.50	552.50
32	51,200.00	40.00	1,280.00
3	4,000.00	40.00	120.00
12	18,032.60	40.00	480.00
13	19,400.00	34.00	442.00
43	80,000.00	32.50	1,397.50
9	15,776.17	31.00	279.00
40	60,000.00	30.00	1,200.00
9	16,000.00	25.00	225.00
10	16,741.38	25.00	250.00
70	140,000.00	25.00	1,750.00
32	49,000.00	20.00	640.00
15	22,843.96	20.00	300.00
68	110,110.90	20.00	1,360.00
2,521	$4,306,122.36		$217,560.80

tance than the task of bringing the local shipping association to greater efficiency. This is being done in Missouri. A large number of managers have been shown how to sell stock in coöperative shipments by grade. An adequate accounting system, not too complicated for the average manager, has been furnished seventy-five associations in Missouri. Results obtained already furnish great encouragement for carrying improved methods to the remaining associations.

The success of coöperative live stock marketing in Missouri, as elsewhere, has largely rested on the fact that the system was more economical than any system formerly employed. Fifty-six Missouri associations, shipping an average of 45 cars in 1920, have furnished statements of estimated saving effected through coöperative marketing. The details are supplied in the following table. The average saving per car on all classes of stock was $86.30. This is equivalent to 5.05 percent. The average saving per association for the year given is $3,885.00. In view of the fact that many of these associations, each employing one manager to work on a small commission, are known to be doing in each case the work formerly done by from one to fifteen buyers, the figures given in the table are considered very conservative.

THE LENGTH OF THE FARMER'S WORKING DAY.

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The cost accounting studies in Minnesota conducted coöperatively by the University of Minnesota and the U. S. Dept. of Agriculture bring out some interesting facts in regard to the length of the farmer's working day, as shown by the following figures. It is further interesting to compare these figures with those collected on similar types of farming in the same localities fifteen years ago.

County.	Year.	Hrs. per Man per Day.	
		Week Day.	Sunday.
Steele	1920	10.9	5.7
Rice	1902–7	8.9	3.6
Cottonwood	1920	9.8	3.4
Lyon	1902–7	8.7	3.1

In Steele County dairy farming predominates with pork production the next most important enterprise in point of receipts. The crops grown are the small grain, corn, and hay, and are used largely for feed. Rice County adjoins Steele County and practiced the same general type of farming during the period covered with perhaps a little less emphasis on the dairy business.

In Cottonwood County general or mixed farming prevails with dual purpose or beef cattle and hogs the principal livestock enterprises and corn, oats and hay the principal crops. Lyon county is located quite close to Cottonwood and a similar type of farming prevailed there during the period covered.

It is interesting to note that the increase in length of working day has been twice as great in case of the dairy farms as it was with the general farms. It is also worthy of note that this lengthened working day has come in spite of milking machines, tractors, autos, and the other various forms of labor saving equipment that have been added to the farms since the first figures were collected. It is further significant that this increase has come during a period when the workers in other industries were enjoying a marked decrease in their working hours.

STATE PROGRAMS OF WORK IN FARM MANAGEMENT AND FARM ECONOMICS.

MINNESOTA.

1. *Cost of Production.*—Farm management investigations in Minnesota have for twenty years centered around the cost of making farm products. This is the major project at the present time. In conducting the investigation the statistical route method is used. Two routes have been established, one at Owatonna in southeastern Minnesota, where dairying and hog-raising are important enterprises, and one at Windom in southwestern Minnesota, where hogs and beef cattle are the most important enterprises. There are 25 farms on the Owatonna route and 23 on the Windom route. Data are secured on the complete farm business of each farm. The farms are measured and the results summarized annually. The investigation is being made in coöperation with the United States Department of Agriculture and will extend over a period of five years or more.

2. *A Study of Farm Development in the Cut Over Land.*—A second project which is also in coöperation with the United States Department of Agriculture, is a farm management survey in northern Minnesota. The purpose of this study is to determine the most effective form of organization and management in developing a farm from cut over land. The study extends over a three year period and will be finished this year. For comparative purposes the survey has been extended to cover a newly settled area in the prairie regions. This affords some interesting information on the difficulties to be overcome and the rapidity of development.

3. *Physical Organization of Farms.*—In securing the cost of production records the farms are surveyed and platted annually. This gives an excellent opportunity to secure data on the physical features of the farms. Advantage is being taken of the opportunity to learn the influence of farm layout on economy of operation. The study is being made to include the farmstead and building arrangements as well.

Extension Project.

The extension activities in Farm Management include (1) A project which has for its object more extensive record keeping by farmers;

(2) Assisting farmers to study cost of production; (3) Assisting in marketing problems; (4) Calling attention to lease systems that look to maintaining fertility and better farming; (5) Encouraging farmers to keep records of feed, labor and shelter requirements of various classes of farm animals and profits from them.

These demonstrations are localized to some extent, though state wide in their character and application. They are made by the farm management specialist working in coöperation with the County Agents.

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OHIO.

A. Research.

1. *Farm Cost Accounts.*—Two cost accounts routes were started January 1, 1920, in coöperation with the United States Department of Agriculture. This involves the keeping and summarizing of detailed cost accounts on the entire farm business.

2. *The Influence of the Tractor on Farm Organization.*—A continuous survey of tractor farms to study the influence of the tractor on farm organization. The cost of operating the tractor is also secured. Carried on in coöperation with the U. S. D. A.

3. *The Prices of Ohio Farm Products.*—A historical and comparative study.

4. *A History of Land Values in Ohio.*—A historical study.

5. *The Marketing of Ohio Tobacco.*—The methods and costs of marketing Ohio tobacco: A field study.

6. *Social Organizations Among Ohio Farmers.*—Information secured by field work, correspondence and personal interviews.

B. Extension.

1. *Farm Management.*—
   (*a*) Permanent farm management work.
   (*b*) Farm accounting and farm organization.
   (*c*) Cost accounting.
   (*d*) The efficient use of labor on the farm.
   (*e*) Farm layout.
2. *Marketing.*—
   (*a*) Grading and standardization.
   (*b*) Business essentials in marketing.

(*c*) Encouragement and development of marketing, programs for county and township marketing committees of the farm bureau.

3. *Social Life.*—

(*a*) Development of community improvement programs.

(*b*) Community welfare conferences.

(*c*) Club programs and community entertainments.

All these projects, both research and extensions, are already under way. We will continue them for the coming year.

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KANSAS.

All of the work in farm management investigations being conducted at the Kansas State Experiment Station is in coöperation with the Office of Farm Management and Farm Economics of the United States Department of Agriculture. Three cost of production routes are in operation. Detailed costs are being obtained on two of these routes. Approximately twenty-five farmers are included in each route. The third route deals with the cost of producing beef in the Flint Hills region of Kansas where most of the beef is produced on grass. Detailed costs are being obtained on about eight thousand steers grazing on approximately forty thousand acres of land.

The studes in the detailed cost routes are located in Jackson and McPherson Counties. Jackson County is in the northeastern part of Kansas and is fairly typical of that portion of the state most nearly approaching corn belt conditions. The farms included in the McPherson area are devoted to wheat production to a large extent. On all of these farms wheat is a major enterprise. Some of them, however, follow a more general type of farming than the others. It is hoped that this work will give a comparison between the general farm on which wheat is the major enterprise as compared with the wheat farm on which wheat is the sole source of income.

As a background for these studies, the Experiment Station has labor income survey records for more than 2,000 farms scattered throughout the state. These survey data will be used to supplement the detailed cost data now being obtained. The plan is to continue these detailed cost routes for at least five years. They were started January 1, 1920, with the exception of the route in Chase County, which was started in April of 1921.

These three routes are only a portion of the total number planned for the entire state. At least ten routes will be needed before data are obtained typical of all sections of the state. It is possible that these routes will not all be going at the same time, but at the end of five or more years, funds used for the routes now going will be transferred to routes in other parts of the state.

The marketing investigations conducted at this time by the Kansas Experiment Station include a study of the marketing of Kansas wheat. This study was started September 1, 1920. The first phase of the problems taken up was the farm storage of wheat. A study of the status and conditions of farm storage including farm storage capacity has been completed on seven hundred forty-three farms in twenty-nine Kansas counties. The following are some of the important problems concerning which these studies give information:

1. The monthly rate of demand for wheat by the mill and export trade of the United States for the last six crop years.

2. The monthly rate at which the Kansas farmer has put his wheat on the market during the last six crop years.

3. The excess or shortage of farm marketing month by month as compared with the commercial demand month by month for the last six crop years.

4. The approximate situation with regard to supply of farm storage in twenty-nine counties where surveys have been made.

5. Percent of 1920 wheat crop marketed direct from the machine in twenty-five representative counties, and the relation of distance to market to percent of crop marketed direct from the machine.

6. The percent of the area of each county of the state that is within 3¾ miles of one or more elevator stations, 3¾ miles being found to be about the maximum distance wheat could be economically marketed direct from the machine to the elevator, where team hauling was the most common method.

7. The amount of money borrowed to hold wheat (1920 crop) per bushel of wheat held in storage and rate of interest paid in some typical communities.

W. E. Grimes.

State Agricultural College,
Manhattan, Kansas.

Mississippi.

We are now completing tabulation and survey data on 160 farms in Jones County, Mississippi, and will begin tabulating the data on

140 farms in the trucking section of Copiah County by July 1. The other 150 records taken in Mississippi have been used for class purposes and not for tabulation.

This fall we expect to take some 600 records in 4 sections of this State, all of which we expect to tabulate. These projects will be worked in coöperation with the Washington office of Farm Management and Farm Economics.

One rather interesting project is being taken on in coöperation with the boys club Department of the Mississippi Extension Force. About 50 of the outstanding club members of the State were enrolled in a Boys' Farm Management Club. These boys keep complete daily records and mail same to us at the close of each week. These records, together with Farm Management Account Books, both of which are furnished by this Department, give us a complete record of the year's business. We are using this method as a substitute for a route man and up to the present date this method is working nicely.

I have recently made an automobile trip of the State, in which I visited each of these boys. I find the most excellent interest exhibited by both the boys and their parents.

J. N. Lipscomb.

Agricultural College,
Mississippi.

THE NEW BUREAU OF ECONOMICS IN THE U. S. DEPARTMENT OF AGRICULTURE.

The Bureau of Markets and the Bureau of Crop Estimates of the U. S. Department of Agriculture were amalgamated on July 1, 1921. Dr. H. C. Taylor, formerly Chief of the Office of Farm Management and Farm Economics, was appointed Chief of the new bureau. Mr. L. M. Estabrook, formerly Chief of the Bureau of Crop Estimates, was made Associate Chief under the new organization. This is the first step in the direction of a closer and more intimate coordination of the economic work of the Department. A further step will be proposed by Secretary Wallace in the appropriation bill for 1922–23, in which the work of the Office of Farm Management and Farm Economics will be merged with the Bureau of Markets and Crop Estimates. The new bureau will probably be known as the Bureau of Agricultural Economics.

It is expected that the regulatory work now in the bureau will be placed under a Federal agricultural marketing board, which will be charged with the administration of various laws relating to marketing, such as the Grain Standards Act, the Cotton Futures Act, the Standard Container Act, and the Warehouse Act. According to preliminary plans the research and extension activities of the new bureau will be grouped and developed in twelve important divisions. The tentative organization will be about as follows:

Division No. 1 will be concerned with the general business administration of the Bureau.

No. 2. Farm Management or the organization of production will deal with studies such as (*a*) types of farming, (*b*) size of the farm business, (*c*) farm buildings or layouts, (*d*) the effective use of labor and equipment, (*e*) the intensity of production, (*f*) cost factors and their relation to farm organization, (*g*) price trends and their relation to farm organization, and (*h*) comparative studies of farm management methods and practices.

No. 3. Cost of production and distribution will combine the important cost studies now being carried on by the Office of Farm Management and Farm Economics and the marketing cost investigations recently begun by the Bureau of Markets. Particular attention will be given to (*a*) the elements of cost for each step of production and distribution, (*b*) the relation of cost to charges for services, (*c*)

the relation of costs and prices, (*d*) the relation of cost studies to better business methods in production and distribution and (*e*) the relation of supply to demand.

No. 4. Marketing of farm products or the organization of distribution will make (*a*) a descriptive study of the methods and practices of marketing each farm crop, (*b*) market condition, (*c*) demand for specific crops, (*d*) sources of supply, (*e*) the preparation, grading, handling, transportation, and storage of these products, (*f*) cooperative marketing, and (*g*) fundamental problems of standardization and grading.

No. 5. Market Inspection of Perishable Foods will make destination inspections of fruits and vegetables at designated markets on the request of any financially-interested party (shipper, carrier or dealer) and will issue certificates as to quality and condition, that are accepted as prima facie evidence in any Federal Court. This work is conducted under authority contained in the Food Products Inspection Law.

No. 6. Agricultural competition and demand in foreign countries will investigate (*a*) agricultural conditions in countries that compete with the United States, (*b*) the agricultural potentialities of competing countries, (*c*) farm management and marketing practices in competing countries, (*d*) demand and opportunities in foreign markets, and (*e*) demonstrations to encourage consumption.

No. 7. Agricultural prices and statistics will make provision for the collection of (*a*) complete information regarding the production and distribution of farm products, (*b*) crop and live-stock production in the United States and foreign countries, (*c*) stocks on hand, (*d*) demand and consumption, (*e*) prices of farm and manufactured products.

No. 8. Agricultural readjustments or agricultural history and geography will endeavor to interpret and explain (*a*) the trend of agricultural prices and the trend of agricultural production, (*b*) the development or decline of markets, (*c*) shifts in agricultural production, (*d*) geographic factors determining the types of farming, (*e*) the geography of the world's production, (*f*) and will complete preparation and publication of Atlas of American Agriculture.

No. 9. Agricultural finance will involve investigations of (*a*) the methods of financing production and marketing of farm products, (*b*) insurance of buildings, live stock and stocks in storage, (*c*) taxation and its relation to production and distribution, and (*d*) the financing of rural public utilities and other group enterprises.

No. 10. Land economics will embrace such studies as (*a*) land resources and utilization, (*b*) land values, (*c*) ownership and tenancy, (*d*) the farm labor supply and movement, (*e*) land settlement, and colonization, (*f*) methods of renting and other problems relating to land and labor in agriculture.

No. 11. Country life and rural organization will consider (*a*) the characteristics and movements of rural population, (*b*) rural home life and its relation to agriculture and population movements, (*c*) opportunities for social contacts typical in rural communities, (*d*) rural organization, (*e*) the relation of educational and religious institutions to farm life problems, and (*f*) the various effects of farm labor, tenancy and landlordism.

No. 12. Market information will make every practicable effort to extend the market news services of the Bureau; to develop other outlets for market and other available information such as the Marketgram and Radio News Service developed during the past year; to coöperate with the States in extending and utilizing such services; to develop further exhibits and demonstrations and extend their use; and to conduct the press and publication work of the Bureau.

ANNUAL MEETING OF THE AMERICAN FARM ECONOMIC ASSOCIATION.

The 1921 meeting of the American Farm Economic Association will be held at Pittsburgh, Pennsylvania, during the Christmas holidays. The exact date of the meeting has not been arranged as yet. These dates will be announced in the October issue of the JOURNAL. A tentative program will also be published in the October number. The American Economic Association and other associations will convene in Pittsburgh at the same time, thus members of the American Farm Economic Association will have an opportunity to hear some of the addresses that are presented at these other meetings.

REPORT OF COMMITTEE ON EXPERIMENT STATION FUNDS AND WORK.

After reviewing the work of previous committees this committee decided that the best way to go about the matter of securing additional support for investigations in farm management and farm economics was through the executive committee of the American Association of Colleges and Stations.

Correspondence was conducted therefore with President R. A. Pearson of Iowa, chairman of the committee. Mr. Pearson was willing to have the matter presented to the Experiment Station Section of the National Association and referred the Committee to Dean A. R. Mann of Cornell University, who was charged with preparing the program for the Springfield meeting.

Dean Mann informed this committee that the matter had already been given considerable attention and that it was being provided for in the program for the annual meeting of the association at Springfield.

At the suggestion of the chairman of this committee Dean Cooper of Kentucky was requested to discuss the question of needs for additional support before the Experiment Station Section of the National Association of Colleges and Stations, provision being made for the discussion by Dean Mann in charge of the program. Other members of the Farm Economic Association were requested to be present at the Springfield meeting and support Dean Cooper in the matter.

In discussing this matter at the National Association meeting Dean E. A. Burnett of the Nebraska station offered a copy of a resolution passed by a special committee at Chicago in April. This resolution asked for an amendment to the Hatch Act providing for an increase in experiment station funds of $15,000 for the first year, and $10,000 per year until the total additional funds should be $85,000 per annum, exclusive of the original Hatch appropriation. Provision was made in the resolution also that "Unless it should appear that under the terms of the Hatch Act as at present drawn, the use of funds for investigation and research in the economic and social aspects of agriculture and home economics is permitted, the amendment should be so drawn as to include them."

The matter was presented to the Experiment Station Section and secured approval. It was then referred to the general session and again approved and referred to the executive body. It is our understanding that the executive body looked upon the matter with favor, but no official report is available from that body as to final action taken.

To sum up the year's work, therefore, I would say that the matter has been presented to the executive committee of the National Association of Colleges and Stations; that discussion on the subject was provided for by them at the annual meeting of the National Association of Colleges and Stations; that it was acted upon favorably by the Experiment Station Section and at the general session, and that it has been referred to the executive body for final consideration. It is hoped, through their recommendation that the desired amendment may be secured and that of the additional funds asked from Congress a fair proportion may be made available for investigational work in farm management and farm economics.

The Committee on Experiment Station Funds and Work for the ensuing year should keep before the executive body of the National Association of Colleges and Stations, the importance of such investigations and attempt to secure adequate funds from any appropriation that may be made.

ANDREW BOSS,
Chairman of Committee on Experiment Station Funds and Work.

FARM ECONOMIC NEWS ITEMS.

Mr. W. H. Youngman and Mr. C. W. Crickman, graduating this year in Farm Economics and Farm Management at the University of Illinois, have recently been appointed Research Assistants in the Department of Agricultural Economics at Iowa State College. These men will assist Professor Nourse with some investigations in the organization of grain elevators and in problems of grain marketing.

Mr. Eric Englund, a graduate student at the University of Wisconsin, accepted a position with the Department of Agricultural Economics at the Kansas Agricultural College on July 1. Mr. Englund is a graduate of the Oregon Agricultural College and of the University of Oregon and has taken considerable graduate work in Agricultural Economics at the University of Wisconsin. Mr. Englund assumed the duties of W. E. Grimes, Acting Head of the Department of Agricultural Economics, who has been granted leave of absence during the year 1921–22 for graduate study.

Mr. Homer J. Henney, a graduate of the Kansas State Agricultural College in 1921, has been appointed agent in the Office of Farm Management and Farm Economics and research assistant in Agricultural Economics at the Kansas Experiment Station. Mr. Henney's work is in connection with the cost of beef production study being conducted coöperatively by the Office of Farm Management and the Kansas State Agricultural Experiment Station.

Mr. Hutzel Metzger, who has been agent in Farm Management at the Experiment station in North Dakota, in coöperation with the Office of Farm Management and Farm Economics, during the past six months, has been promoted to Assistant Farm Management Demonstrator in the Extension Division.

Mr. Theodore S. Thorfinson, who is a 1921 graduate of the North Dakota Agricultural College, becomes Agent in Farm Management in coöperation with the North Dakota Experiment Station, succeeding Mr. Hutzel Metzger, July 1.

Mr. J. H. Shaffer, who graduated at the West Virginia University in June, has accepted a position with the Department of Farm Economics in the same institution. Mr. Shaffer's work will consist of investigation and teaching.

Dr. F. S. Harris, Director and Agronomist of the Utah Agricultural Experiment Station, has been appointed President of the Brigham Young University at Provo, Utah. His resignation as Director was effective September 1, 1921. Prof. William Peterson, Geologist of the Utah Station, has been appointed as Director to succeed Dr. Harris.

Mr. E. C. Westbrook, Tobacco Specialist, of the Georgia State College of Agriculture, and Mr. De F. Hungerford of the same institution recently completed a cost of production survey of tobacco in southeast Georgia. Mr. J. P. Purdom, formerly with the Office of Farm Management and who is now farming at Blackshear, Georgia, assisted in collecting the data. They expect to issue a preliminary statement in the near future.

The Experiment Station at Wooster, Ohio, and the College of Agriculture at Columbus are coöperating in carrying out a three-year study of the trucking industry in the Muskingum Valley.

A Summer School for Rural Pastors was conducted at the Ohio State University, July 11–22, under the auspices of the College of Agriculture and the Ohio Federation of Churches.

Through the coöperation of the Farm Management Department of the Experiment Station with the Extension Division and the County Farm Bureas, cost of production investigations are being conducted on 185 farms in twenty counties in Utah. Daily labor records, feed records, cash receipts and expenses are being maintained by these farmers, as well as other material necessary for determining the cost of production. The County Agents act as field representatives in checking up and assembling the data. The material assembled, as above indicated, is to be used both for farm organization studies and cost of production. The year's business of each farm is being assembled so that the usual labor income statements will be available.

At the Utah Agricultural College the heretofore separated departments of Agricultural Economics and Farm Management, beginning July 1, 1921, will be under one head, Dr. E. B. Brossard.

At the Tennessee Agricultural College about one hundred and twenty-five students have been enrolled in the classes of Agricultural Economics during 1920–21. These courses were organized for the first time in 1919–20 and enrollment during the past year has been approximately double that of the previous year.

Two very comprehensive tenant studies have been completed by the Tennessee Experiment Station in coöperation with the Office of Farm

Management and Farm Economics. One of these studies was made in Middle Tennessee and the other in West Tennessee, and a bulletin summarizing the results will soon be prepared.

Mr. C. R. Chambers of the Office of Farm Management and Farm Economics has arranged for coöperation with the Tennessee Experiment Station in a study of the history of land prices in Tennessee, Mr. C. E. Allred of that Station is in charge of the work, which has already been started by Mr. B. B. Bird, a graduate of the Tennessee Agricultural College.

Mr. C. C. Taylor, formerly assistant farm management demonstrator at Boise, Idaho, has been added to the Experiment Station Staff, Iowa State College, as Assistant. In conjunction with Mr. Harry H. Clark of the Office of Farm Management, he is working on a follow-up study of land values in Iowa. Both these men worked before on this same study. The present study will cover 19 counties in the southern, central, and northwest parts of the State.

Mr. Elwyn L. Cady, who graduated from the University of Missouri this year, has been added to the staff of the Iowa Experiment Station as Assistant. His first work will be in connection with the statewide survey of Farmers' Elevators.

Mr. S. H. Thompson has returned to extension work in Iowa after a year with the Curtis Publishing Company. His new title is Extension Professor of Agricultural Economics and he will be in charge of extension work in farm management and marketing.

Mr. R. C. Engberg, Associate Professor of Farm Management, at Iowa State College has made arrangements to take graduate work at the University of Minnesota this year.

Mr. F. W. Peck, who has been in charge of the section of cost of production and farm organization in the Office of Farm Management and Farm Economics, U. S. Department of Agriculture, for the past two years, has tendered his resignation and has accepted an appointment as Extension Director in the College of Agriculture, Minnesota. Mr. Peck was the Secretary-Treasurer of the American Farm Economic Association during the years 1919 and 1920.

The Colorado Legislature at its recent session passed an Act to establish and maintain a department of Economics and Sociology at the State Agricultural College, Fort Collins. This department will give

instruction in the economics of agriculture and mechanic arts as represented in farm management, labor relations, credits, marketing of farm products and the accounting connected therewith, and in the human relations between rural and urban communities. A part of the appropriation provided will be devoted to research investigations in economics and sociology as related to agriculture and the industries, and in publishing and for Extension short courses.

Mr. L. A. Moorhouse, of the Office of Farm Management and Farm Economics, Washington, D. C., has accepted the chair of Professor of Rural Economics in the newly organized Department of Rural Economics and Marketing established this year at the Colorado Agricultural College. Mr. Moorhouse will arrive to take charge of the new department approximately November 1st. The new department will give instructional work in Economics, Rural Economics, Farm Management, Markets, and Cost Accounting for farms and rural coöperative enterprises. The Farm Management work, started and developed to its present status by the Agronomy Department, will be transferred to the new department. Farm Management Demonstrations, now under the supervision of the Agronomy Department, will be transferred to the new department.

Four farm management routes have been organized in Michigan and work has been started in assembling records in four distinct areas. These routes represent (1) the dairy section; (2) the feeder section; (3) a group of potato farms, and (4) a general farming section. A fifth route will be added next year. This will include a general farming region. There are twenty-five farmers on each route and the route men visit these farms once a month.

The Michigan State Grange, which has a committee on farm accounting, was instrumental in having this work initiated in this State. The Grange has also taken very active interest in the matter of inducing farmers to keep accounts on their own individual farms.

Mr. Frank Montgomery who has been associated with farm organization studies in the Office of Farm Management and Farm Economics, U. S. Department of Agriculture for the past six years, has resigned to accept a position with the Berea College, Berea, Kentucky.